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# THE CENTRAL NERVOUS SYSTEM OF THE PARASITIC ISOPOD, GRAPSICEPHON

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Some specimens of the genus Grapsicephon of the Bopyridae were obtained from the gill chambers of the common shore crab of Laguna Beach, *Pachygrapsus crassipes* Rand. One of these was sent to the United States National Museum and there determined to be of the genus here given.

Two specimens were sectioned and mounted in series; one was stained in carmine and one in hematoxylin. Only in the latter specimen was the poorly developed nervous system distinguished easily from the surrounding tissues. No supraesophageal ganglion was found and the ventral chain of ganglia was imperfectly developed. The whole central nervous system does not exceed one millimeter in length, or a little less than one twelfth the length of the animal. A wax reconstruction was made of the central nervous system showing the locations of the cellular areas.

There are at least four ganglia represented in the nervous system, but these are very imperfect and irregular ganglia. Beginning at the cephalic end the ganglion is quite well fused and occupies one third the whole length with no branches for some distance; then there are large irregular branches extending laterad. Next there is a division into something like connectives and other branches extending laterad, although these do not show well in the model, because they seem fused with the other parts. Near the caudal end of the ganglionic mass there are other divisions into connectives and near these, short branches. Altogether, there are six very irregular pairs of lateral branches which could be followed only for a short distance from the central nervous system, and four branches which arise from the caudal end.

The distribution of cells is on the whole much like that of other arthropods. Most of the cells are ventral in position, but irregular masses are seen at places on the dorsal side. The cells in many cases seem but poorly developed; the nuclei in some cases are like those of nerve cells, but most of them appear like poorly preserved material, although the general preservation of all parts of the specimen except this was very good.

In conclusion, it might be said that the animal has a degenerated central nervous system with indications of at least four ventral fused

ganglia. Branches are not perfectly formed and cannot be traced very far. Although there were a few striated muscle fibers in the animals, the movements of the living forms were very slight. If there is a dorsal ganglion it is so poorly differentiated as to be indistinguishable from the other tissues of the animal.

#### EXPLANATION OF PLATE

Fig. 1.—Drawing of a model of the nervous system of *Grapsicephon*, from the dorsal side, showing the cell areas in the more deeply shaded portions. The cephalic end is at the left.  $\times 80$ .

Fig. 2.—Drawing of a model of the nervous system of *Grapsicephon*, from the ventral side, showing cell areas by more deeply shaded regions. The cephalic end is at the left.

Figs. 3, 4, and 5.—Sections through various levels of *Grapsicephon*, central nervous system. The dorsal side is uppermost.  $\times 300$ .

Fig. 6.—Surface view of the whole body of *Grapsicephon*. Drawing by Harry Staples.  $\times 3$ .

*HILTON—CENTRAL NERVOUS SYSTEM OF GRAPSICEPHON*

